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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/564,856

01/17/2006

Yasushi Inagaki

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7590

02/26/2009

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2841

NOTIFICATION DATE

DELIVERY MODE

02/26/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<i>Office Action Summary</i>	Application No.	Applicant(s)	
	10/564,856	INAGAKI ET AL.	
	Examiner	Art Unit	
	Ishwar (I. B.) Patel	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 5-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to amendment filed on January 21, 2009.

Response to Amendment

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strandberg (US Patent No. 6,323,435) in view of Tsukada (US Patent No. 6,809,415).

Regarding claim 1, Strandberg in figure 1-3 discloses a multilayer printed wiring board comprising: a core substrate (12) ; a first conductive layer (14) formed on the core substrate; an interlayer insulation layer (30) formed on the first conductive layer and the core substrate and a second conductive layer (36) formed on the interlayer insulation layer, wherein the first conductive layer on the core substrate has a thickness which is larger than a thickness of the second conductive layer on the interlayer insulation layer (the invention is for very thin build up wiring layer, column 3, line 5-65),

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and the first conductive layer on the core substrate has a side face which is tapered, an angle, θ , formed by a straight line connecting the top end and bottom end of the side face of the conductive layer and a horizontal face of the core substrate (see figure 2, shown in more detail).

Strandberg does not explicitly disclose the angle, θ , satisfies $2.8 < \tan \theta < 55$.

Tsukada in figure 2A discloses a circuit board with the conductive layer (3) having a taper angle with the $\tan \theta$ about 7 (column 4, line 25-35) and further recites that this will help in better adhesion between the substrate and the conductive layer (column 1, line 25-40).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Strandberg with the angle θ meeting the limitations as recited in the claim, as taught by Tsukada, in order to improve the adhesion between the substrate and the conductive layer.

Further, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 4, Strandberg further discloses the first conductive layer on the core substrate is a conductive layer for power source or a conductive layer for grounding (Strandberg disclose the conductive layer, using the layer as power or ground does not add any structural limitation, therefore Strandberg meets the limitation).

Further, the limitation the first conductive layer on the core substrate is a conductive layer for power source or a conductive layer for grounding, merely require the conductive layer "capable" to be used as a power source layer or a ground source layer. It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138 (CCPA 1946).

Regarding claim 19, Strandberg further discloses a via hole (34) formed in the interlayer insulation layer and electrically connecting the first conductive layer on the core substrate and the second conductive layer on the interlayer insulation layer.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified board of Strandberg as applied to claim 1 above, and further in view of Westbrook (US Patent No. 6,203,967).

Regarding claims 2 and 3, Strandberg discloses all the features of the claimed invention as applied to claim 1 above including the first conductive layer on the core substrate is thicker than the conductive layer on the interlayer insulation layer but does not explicitly disclose the thickness of the first conductive layer on the core substrate is α_1 , the thickness of the second conductive layer on the interlayer insulation layer is α_2 , and the α_1 satisfies relation of $\alpha_2 < \alpha_1 < 40 \alpha_2$, as recited in claim 2 and discloses the

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thickness of the first conductive layer on the core substrate is α_1 , the thickness of the second conductive layer on the interlayer insulation layer is α_2 , and the α_1 satisfy a relation of $1.2 \alpha_2 < \alpha_1 < 40 \alpha_2$, as recited in claim 3.

However, the invention of Strandberg is providing high density interconnects with thin built up wiring layers.

Westbrook in figure 2 discloses a circuit board with thin build up wiring layers and further recites that thickness of first conductive layer on the core substrate is about 10 times as thick as said on the interlayer insulation layer (column 12, line 22-24).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Strandberg with the thickness of conductive layer on the core substrate and that on the interlayer insulation layer meets the limitations as recited in claims 3 and 4, as taught by Westbrook, in order to have high density circuit board.

Further, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

6. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chiu (US Patent Application Publication No. 2004/0011555 discloses a circuit board with tapered (trapezoidal) wiring pattern.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
February 19, 2009

/Ishwar (I. B.) Patel/
Primary Examiner, Art Unit 2841